

rays, which are not quite half as long as the body: the last anal ray prolonged. The ventral fin extends beyond the origin of the anal. Body light brownish, marbled with darker; the lower part of the sides of the trunk and tail with numerous pearl-coloured vertical lines; belly pearl-coloured. Sides of the head with numerous small white ocelli edged with violet. Both dorsal fins with large, rather irregular, rounded whitish spots, each with a narrow violet edge; there are fine white dark-edged lines and dots within the large spots; a narrow, black, blue-edged spot behind the extremity of the first dorsal spine. Caudal and pectoral fins with white dots, which are mixed with brown ones on the lower half of the caudal. Oblique pearl-coloured lines behind each anal ray.

Melbourne. The description is taken from a male specimen, 5 inches long.

XXIII.—On the Structure of Antipathes.

By M. LACAZE-DUTHIERS*.

Two species form the subject of this memoir—namely, *Antipathes subpinnata* and *A. Larix* (Esper, Lamarek). Of all the Corals, they are the most difficult to investigate; and no doubt it is on this account that we have so little precise information about them. They live at great depths, and are only brought up by those coral-fishers who work upon the rocks. They are formed of so delicate a tissue that the shortest exposure to the air is sufficient to dry them up; and as it is only with great trouble that the fishers can be persuaded to keep them in water while they are at sea, the naturalist has much difficulty in obtaining them in a fit state for examination.

In the two species which I have observed living, the polypes are regularly arranged in a line upon one side only of the branches—namely the upper surface, or that which is opposite to the attachment of the polypary.

Each animal, as observed by Ellis, Solander, and Dana, has six tentacles, arranged in a rosette round the mouth. These tentacles do not appear to elongate themselves much; most frequently they seemed to be merely six large tubercles; but, perhaps, in the normal condition at the bottom of the sea the elongation may be greater. The body does not rise into a tube projecting above the sarcosoma, but only forms a mamilla: in this respect it is very different from that of *Gerardia*.

The diameter of the rosette of the largest polype in *A. subpinnata* does not exceed 1 millim., and it is larger than that of *A. Larix*. Judging from the observations which can be made

* Translated from the 'Comptes Rendus' for July 25, 1864.

in the collection of the Museum, there must exist great differences in the size of the polypes in the different species—as, for instance, in *Antipathes scoparia*, Lamarck, and *A. glaberrima*, Esper (*Leiopathes glaberrima*, G.). When the tentacles are contracted, the polype only forms a large mamilla, upon which no traces of the tentacles are to be distinguished. In many dried specimens, however, we may see six tubercles surrounding the mouth, which forms a seventh.

The general cavity of the body in *A. subpinnata* presents a very remarkable arrangement, which has nothing analogous to it in any known Coral. When the peristome is examined, six lines are seen radiating around the mouth; these evidently correspond with the peripheral septa which are known to exist in all these animals; but four of the lines become effaced not far from the mouth, in the midst of the tissues. Two larger ones, opposite to each other, alone bear the convoluted filaments; these two septa are usually in the plane passing through the axis of that portion of the polypary which bears the animal to which they belong.

This arrangement is very remarkable. In investigating the development of the *Actinia*, we find that the formation of the peripheral chambers of the general cavity commences by the production of two septa, which, retaining the advance that they have before the rest, always appear to be more developed, and correspond to the angles of the commissures of the mouth. In *Antipathes* these first two septa alone appear to attain complete development; the others are scarcely indicated by the lines above mentioned.

In these, as in other Coral-polypes, we find an œsophagus leading from the mouth, upon which the inner margins of these two septa are attached. It must also be observed that the convoluted body, which is of comparatively very large size, appears to occupy the whole of the free margin of the septum.

The tissue of the walls of the body is of extreme delicacy. It is composed of two sets of cells, in which two distinct layers are not, as in *Gerardia*, to be recognized. Of these cells some are transparent and turgid with fluid, others opaque and filled with granulations. The latter, by bursting and mixing their contents with the water, give origin to a viscid mucilage, which is very troublesome in making preparations. The cellular tissue is covered with very active vibratile cilia, both within and without.

The nematocysts are ovoid, and of large size. Their thread is short, and its spiral turns are but indistinctly visible through the capsule. They are largest in the convoluted filaments, and are there regularly arranged almost side by side. In the integuments they are grouped in parcels, as in *Gerardia*.

The *Antipathes Larix* which I had in my possession had its convolutions crammed with corpuscles resembling in transparency and tint the testicular capsules of *Gerardia*. If it were not rash to come to any conclusion from observations made on objects not in the best possible state, I should say that the sexes are separate, and borne not only by distinct polypes, but even upon distinct polyparies. But I cannot generalize and assert that this is always the case.

The polypary of the true *Antipathes* bristles all over with spinules. These have not escaped other writers, but some of them have erroneously regarded them as abortive branches. The arrangement of these spines may furnish useful characters for the discrimination of the species.

The sarcosoma everywhere covers the polypary, which appears as if enclosed in a sort of distinct sheath. When it contracts, its tissue is traversed by the spicules, as is the case in the *Gorgoniae*.

The growth of the polypary takes place by the deposition of layers which are superimposed upon the stems, and which at the extremities resemble the fingers of gloves enclosed one within the other. The centre of the axis appears to be perforated by a canal; but this is only an appearance due, in fresh individuals, to the inferior density of the substance which has been added at the extremities and become internal, and, in dried specimens, to the contraction of this substance.

Between *Gerardia* and *Antipathes* there are great differences. In the former the polypary is smooth and covered with very small and scarcely sensible umbilicated elevations; in *Antipathes* it is covered with spinules. The twenty-four tentacles of *Gerardia* correspond with as many chambers separated by the same number of septa with convoluted filaments; in *Antipathes* only two of these convoluted cords are developed, and the tentacles are never more than six in number. In *Gerardia* the Actinian type is as highly developed and characterized as possible; in *Antipathes* it remains incomplete, in consequence of a sort of arrest of development.

XXIV.—*On Clays, containing Fossils, near St. Andrews; with Remarks on some of the latter.* By ROBERT WALKER.

THE Clay-bed whose geological position and fossil contents are about to be noticed is situated near the mouth of the Kinness Burn, or rivulet, a small stream that runs past St. Andrews on the south side. Towards the sea this stream has eroded its channel about three feet through the bed. At one time the clay could be seen forming part of the bank on each side of the